



**west virginia** department of environmental protection

Division of Air Quality  
601 57<sup>th</sup> Street SE  
Charleston, WV 25304  
Phone (304) 926-0475 • FAX: (304) 926-

Randy C. Huffman, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

**ENGINEERING EVALUATION / FACT SHEET**

**BACKGROUND INFORMATION**

Application No.: R13-2859  
Plant ID No.: 073-00028  
Applicant: Exterran Energy Solutions, L.P. (Exterran)  
Facility Name: Schultz NGL Extraction Plant  
Location: Belmont, Pleasants County  
SIC Code: 1321 (Extraction Plant)  
NAICS Code: 211112  
Application Type: Construction  
Received Date: September 28, 2010  
Engineer Assigned: Jerry Williams II, P.E.  
Fee Amount: \$2,000.00  
Date Received: September 28, 2010  
Complete Date: November 5, 2010  
Due Date: February 3, 2010  
Applicant Ad Date: October 27, 2010  
Newspaper: *St. Mary's Oracle*  
UTM's: Easting: 479.239 km      Northing: 4351.915 km      Zone: 17  
Description: Construction of a natural gas processing facility.

**DESCRIPTION OF PROCESS**

The following process description was taken from Permit Application R13-2859:

The Schultz Plant is a non-fractionating NGL extraction plant designed to process a maximum of ten (10) MMSCFD of natural gas. The Schultz Plant will consist of inlet gas compression, separation and filtration, molecular sieve dehydration, a cryogenic liquids recovery unit, de-ethanizer system, refrigeration unit and residue compression, including all associated utilities and ancillary systems.

First, the inlet gas is filtered and completely dehydrated in the Molecular Sieve System. Then, the dry gas containing less than 1.0 ppmv of water, is cooled and partially liquefied through a combination of refrigeration recovery via internal cross heat exchange and turbo-expansion. The cold vapor and liquid streams are fed to the de-methanizer, where methane is

removed and ethane is partially removed up to the point where the higher heating value of the residue gas is no more than 1095 BTU/scf. A significant amount of ethane is recovered in the liquid product, and the propane and heavier hydrocarbons are recovered in the liquid product as well. The gaseous stream, which constitutes the Schultz Plant's residue gas, is subsequently reheated, recompressed, and routed to the residue gas metering station and pipeline at an operating pressure of between 500-720 psig.

The liquid recollected in the bottom of the de-methanizer is the feedstock of the de-ethanizer tower. The de-ethanizer produces a top stream rich in ethane, which is used as fuel gas for the needs of this facility including the inlet/residue compressors, regeneration heater and power generation. During the startup of the Schultz Plant, natural gas will be utilized to fuel the inlet compressors until the facility produces enough ethane to power the facility. Any purge from the process will be routed to a flare with a 98% control efficiency.

The bottom product off the de-ethanizer is rich in propane and heavies. At least 95% of the propane in the inlet gas stream is recovered in the liquid product. Treated gas will be routed to the tailgate custody transfer meter. NGL products will be routed to pressurized bullet tanks, where they will be trucked off site by an authorized third party. Wash water and process by-products will be routed to an atmospheric tank, where it will be trucked off by a third party.

#### SITE INSPECTION

A site inspection was conducted on October 27, 2010 by the writer. The facility had not been constructed at that time.

Directions as given in the permit application are as follows:

*From Parkersburg, Exit SR-2 off of I-77. Drive east on SR-2 for 10 miles to the junction of SR-2 and CR-10. Go south on CR-10, drive 4.2 miles to junction of CR-10 and CR-1. Bear right onto CR-1 for 1.1 miles to Schultz. Turn right onto Bull Creek Road. Site location is on the west side of Bull Creek Road, 0.3 miles from the turnoff from Henry Camp Road.*

## ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Maximum controlled point source emissions from Exterran's Schultz Plant are summarized in the table below.

Emission Point ID	Emission Unit ID	Process Unit	Pollutant	Maximum Controlled Emission Rate	
				Hourly (lb/hr)	Annual (ton/year)
ENG1	C-101	Caterpillar G3516B Compressor Engine	Nitrogen Oxides	3.04	13.33
			Carbon Monoxide	1.89	8.26
			Sulfur Dioxide	0.01	0.03
			Particulate Matter-10	0.10	0.45
			Volatile Organic Compounds	1.00	4.37
			Formaldehyde	0.27	1.17
ENG2	C-102	Caterpillar G3516B Compressor Engine	Nitrogen Oxides	3.04	13.33
			Carbon Monoxide	1.89	8.26
			Sulfur Dioxide	0.01	0.03
			Particulate Matter-10	0.10	0.45
			Volatile Organic Compounds	1.00	4.37
			Formaldehyde	0.27	1.17
ENG3	C-103	Caterpillar G3516B Compressor Engine	Nitrogen Oxides	3.04	13.33
			Carbon Monoxide	1.89	8.26
			Sulfur Dioxide	0.01	0.03
			Particulate Matter-10	0.10	0.45
			Volatile Organic Compounds	1.00	4.37
			Formaldehyde	0.27	1.17
RENG1	C-151	Caterpillar G3508LE Residual	Nitrogen Oxides	2.78	12.17
			Carbon Monoxide	2.22	9.73
			Sulfur Dioxide	0.01	0.01
			Particulate Matter-10	0.05	0.21

		Engine	Volatile Organic Compounds	0.74	3.22
			Formaldehyde	0.35	1.52
RENG2	C-152	Caterpillar G3508LE Residual Engine	Nitrogen Oxides	2.78	12.17
			Carbon Monoxide	2.22	9.73
			Sulfur Dioxide	0.01	0.01
			Particulate Matter-10	0.05	0.21
			Volatile Organic Compounds	0.74	3.22
			Formaldehyde	0.35	1.52
GEN1	G-901	Caterpillar G3516B LE Generator Engine	Nitrogen Oxides	2.00	8.78
			Carbon Monoxide	2.00	8.78
			Sulfur Dioxide	0.01	0.03
			Particulate Matter-10	0.13	0.56
			Volatile Organic Compounds	2.25	9.84
			Formaldehyde	0.30	1.31
GEN2	G-902	Caterpillar G3516B LE Generator Engine	Nitrogen Oxides	2.00	8.78
			Carbon Monoxide	2.00	8.78
			Sulfur Dioxide	0.01	0.03
			Particulate Matter-10	0.13	0.56
			Volatile Organic Compounds	2.25	9.84
			Formaldehyde	0.30	1.31
HTR	H-711	Regenerator Heater	Nitrogen Oxides	0.12	0.54
			Carbon Monoxide	0.10	0.45
			Sulfur Dioxide	0.01	0.01
			Particulate Matter-10	0.01	0.04
			Volatile Organic Compounds	0.01	0.03
			Formaldehyde	0.01	0.01
L-1	L-1	Truck Loading	Volatile Organic Compounds	0.07	0.01

FL-1	FL-761	Flare	Volatile Organic Compounds	0.04 (pilot) 151.79 (waste)	3.96
			Nitrogen Oxides	0.01 (pilot) 39.59 (waste)	1.03
			Carbon Monoxide	0.06 (pilot) 215.43 (waste)	5.62
FUG	FUG	Fugitive Emissions	Volatile Organic Compounds	2.79	12.20
MSS-1	MSS-1	Malfunction Startup Shutdown Emissions	Volatile Organic Compounds	99.86	3.00

The following table represents the total facility emissions:

Pollutant	Maximum Annual Facility Wide Emissions (tons/year)
Nitrogen Oxides	83.46
Carbon Monoxide	67.87
Volatile Organic Compounds	58.43
Particulate Matter-10	2.93
Sulfur Dioxide	0.18
Formaldehyde	9.18
Total HAPs	9.18

The following table indicates the control device efficiencies that are being utilized:

Emission Point ID	Control Device	Emission Unit	Pollutant	Control Efficiency
ENG1 ENG2 ENG3	Oxidation Catalyst	Caterpillar G3516B Compressor Engine	Carbon Monoxide	80 %
			Volatile Organic Compounds	50 %
			Formaldehyde	80 %
GEN1 GEN2	Oxidation Catalyst	Caterpillar G3516BLE Compressor Engine	Carbon Monoxide	80 %
			Volatile Organic Compounds	40 %
			Formaldehyde	60 %

## REGULATORY APPLICABILITY

*Unless otherwise stated WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH and 40 CFR 63, Subpart ZZZZ.*

The following rules apply to the facility:

### **45CSR2** (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

Exterran would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

### **45CSR4** (To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors)

45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable. No odors have been deemed objectionable.

### **45CSR13** (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

45CSR13 applies to this source due to the fact that Exterran's modification exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 ton/year, and Exterran is subject to a substantive requirement of an emission control promulgated by the Secretary.

### **45CSR16** (Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60)

45CSR16 applies to this source by reference of, 40CFR60, Subpart KKK and 40CFR60, Subpart JJJJ. Exterran is subject to the recordkeeping, monitoring, and testing required by 40CFR60, Subpart KKK and 40CFR60, Subpart JJJJ.

### **45CSR30** (Requirements for Operating Permits)

As a result of the granting of this permit, Exterran is subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the date of the commencement of the operation or activity (activities) authorized by this permit, unless granted a deferral or exemption by the Director from such filing deadline pursuant to a request from the permittee.

**40CFR60 Subpart KKK** (Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants)

40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984. The Schultz Plant is subject to this rule due to the natural gas liquids extraction plant. Exterran must meet the LDAR requirements of Subpart KKK, which includes the provisions referenced in 40CFR60 Subpart VV.

**40CFR60 Subpart JJJJ** (Standards of Performance for Stationary Spark Ignition Internal Combustion Engines)

Some of Exterran's compressor engines are subject to 40CFR60 Subpart JJJJ, which sets forth emission limits, fuel requirements, installation requirements, and monitoring requirements based on the year of installation of the subject internal combustion engine. 40CFR60 Subpart JJJJ is applicable to owners and operators of new stationary spark ignition internal combustion engines manufactured after July 1, 2007, for engines with a maximum rated power capacity greater than 500 hp.

The three (3) 1,380 hp inlet compressors (ENG1, ENG2, ENG3) will be subject to this rule. The emission limits for these engines are the following: NO<sub>x</sub> – 2.0 g/hp-hr (6.08 lb/hr); CO – 4.0 g/hp-hr (12.15 lb/hr); and VOC – 1.0 g/hp-hr (3.04 lb/hr). Based on the manufacturer's specifications for these engines and the use of an oxidation catalyst, the emission standards will be met.

The two (2) 1,818 generator engines (GEN1, GEN2) will be subject to this rule. The emission limits for these engines are the following: NO<sub>x</sub> – 2.0 g/hp-hr (8.00 lb/hr); CO – 4.0 g/hp-hr (16.02 lb/hr); and VOC – 1.0 g/hp-hr (4.00 lb/hr). Based on the manufacturer's specifications for these engines and the use of an oxidation catalyst, the emission standards will be met.

Because these engines will not be certified by the manufacturer, Exterran will be required to perform an initial performance test within 180 days from startup, and subsequent testing every 8,760 hours or 3 years, whichever comes first.

The following rules do not apply to the facility:

**40CFR60 Subpart IIII** (Standards of Performance for Stationary Compression Ignition Internal Combustion Engines)

Exterran's Schultz Plant does not have any compression ignition internal combustion engines. Therefore, they would not be subject to this rule.

**40CFR60 Subpart Kb** (Standards of Performance for VOC Liquid Storage Vessels)

40CFR60 Subpart Kb does not apply to pressure vessels designed to operate in excess of 204.9 kPa (29.7 psi) and without emissions to the atmosphere. The tanks that Exterran has proposed to install will be operated at 1,723.7 kPa (250 psi), therefore the tanks would not be subject to this rule.

The following rules may apply to the facility:

**40CFR63 Subpart ZZZZ** (National Emission Standards for Reciprocating Ignition Internal Combustion Engines)

**40CFR63 Subpart HH** (National Emission Standards for Hazardous Air Pollutants: Oil and Natural Gas Production and National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

**40CFR63 Subpart HHH** (National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH and 40 CFR 63, Subpart ZZZZ.

These promulgated national emission standards for hazardous air pollutants (NESHAP) limit emissions of hazardous air pollutants (HAP) from oil and natural gas production and natural gas transmission and storage facilities. These final rules implement section 112 of the Clean Air Act (Act) and are based on the Administrator's determination that oil and natural gas production and natural gas transmission and storage facilities emit HAP identified on the EPA's list of 188 HAPs.

**TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS**

There will be small amounts of various non-criteria regulated pollutants emitted from the combustion of natural gas. However, due to the concentrations emitted, detailed toxicological information is not included in this evaluation.



## AIR QUALITY IMPACT ANALYSIS

The changes to this facility do not constitute a major source under 45CSR14. Based on the nature of the emissions and the annual emission rate, no air quality analysis was performed. However, air dispersion modeling will be required if the Director finds existing circumstances and/or submitted data that provide cause for an assessment to be made concerning whether this facility may interfere with attainment or maintenance of an applicable ambient air quality standard or cause or contribute to a violation of an applicable air quality increment.

## MONITORING OF OPERATIONS

Exterran will be required to perform the following monitoring:

1. Monitor and record quantity of natural gas consumed for all engines, and combustion sources.
2. Monitor all applicable requirements of 40CFR60 Subparts JJJJ and KKK.

Exterran will be required to perform the following recordkeeping:

1. Maintain records of the amount of natural gas consumed in each combustion source.
2. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
4. Maintain records of the visible emission opacity tests conducted per the permit.
5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
6. The records shall be maintained on site or in a readily available off-site location maintained by Exterran for a period of five (5) years.
7. Maintain records of all applicable requirements of 40CFR60 Subparts JJJJ and KKK.

### RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates Exterran's Schultz Plant meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Pleasants County location should be granted a 45CSR13 construction permit for their facility.

---

Jerry Williams II, P.E.  
Engineer

---

Date